



## SEQUENCE LISTING

<110> Tartaglia, Louis A.  
Weng, Xun

<120> Nucleic Acid Molecules Encoding GLUTX  
and Uses Thereof

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<141> 2001-10-18

<150> 09/610,417

<151> 2000-07-05

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Glu Arg Arg His Gly Arg Pro Ile Asp Pro Asp Thr Leu Thr Leu Leu	
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Met Gly Ile Asp Gly Gly Val Ala Leu Ser Val Leu Pro Met Tyr Leu	
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Pro Glu Leu Leu Gly Lys Glu Ser Thr Trp Pro Tyr Leu Phe Gly Val	
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Ile Val Val Pro Ala Val Val Gln Leu Leu Ser Leu Pro Phe Leu Pro	
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Asp Ser Pro Arg Tyr Leu Leu Leu Glu Lys His Asn Glu Ala Arg Ala	
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Pro Ala Lys Ile Pro Tyr Val Thr Leu Ser Thr Gly Gly Ile Glu Thr	
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Pro Leu Leu Ile Gly Gly Phe Gly Leu Met Gly Leu Phe Phe Gly Thr	
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Gln Arg Pro Ala Ala Phe Ile Ile Ala Gly Thr Val Asn Trp Leu Ser	
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Asn Phe Ala Val Gly Leu Leu Phe Pro Phe Ile Gln Lys Ser Leu Asp	
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Thr Tyr Cys Phe Leu Val Phe Ala Thr Ile Cys Ile Thr Gly Ala Ile	
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Tyr Leu Tyr Phe Val Leu Pro Glu Thr Lys Asn Arg Thr Tyr Ala Glu	
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Ile Ser Gln Ala Phe Ser Lys Arg Asn Lys Ala Tyr Pro Pro Glu Glu  
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Lys Ile Asp Ser Ala Val Thr Asp Ala Pro Ala Ser Ser Pro Phe Thr  
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act ccg aat aca gcc tgg att caa gct gcc gcc acc acc acc gcc acc 1743  
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acaagtactg acatgtccca tatgttggtt taccactggg ttataacaatg ggaggggagag 1974  
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Arg Lys Asp Trp Ser Cys Ser Leu Leu Val Ala Ser Leu Ala Gly Ala  
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Phe Gly Ser Ser Phe Leu Tyr Gly Tyr Asn Leu Ser Val Val Asn Ala  
65 70 75 80  
Pro Thr Pro Tyr Ile Lys Ala Phe Tyr Asn Glu Ser Trp Glu Arg Arg  
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His Gly Arg Pro Ile Asp Pro Asp Thr Leu Thr Leu Leu Trp Ser Val  
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Thr Val Ser Ile Phe Ala Ile Gly Gly Leu Val Gly Thr Leu Ile Val  
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Lys Met Ile Gly Lys Val Leu Gly Arg Lys His Thr Leu Leu Ala Asn  
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Asn Gly Phe Ala Ile Ser Ala Ala Leu Leu Met Ala Cys Ser Leu Gln  
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Ala Gly Ala Phe Glu Met Leu Ile Val Gly Arg Phe Ile Met Gly Ile  
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Ser Pro Lys Glu Ile Arg Gly Ser Leu Gly Gln Val Thr Ala Ile Phe  
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Met	Tyr	Val	Gly	Glu	Val	Ser	Pro	Thr	Glu	Leu	Arg	Gly	Ala	Leu	Gly	35	40	45	
Thr	Leu	His	Gln	Leu	Gly	Ile	Val	Val	Gly	Ile	Leu	Ile	Ala	Gln	Val	50	55	60	
Phe	Gly	Leu	Asp	Ser	Ile	Met	Gly	Asn	Gln	Glu	Leu	Trp	Pro	Leu	Leu	65	70	75	80
Leu	Ser	Val	Ile	Phe	Ile	Pro	Ala	Leu	Leu	Gln	Cys	Ile	Leu	Leu	Pro	85	90	95	
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Glu	Lys	Lys	Val	Thr	Ile	Leu	Glu	Leu	Phe	Arg	Ser	Ala	Ala	Tyr	Arg	145	150	155	160
Gln	Pro	Ile	Leu	Ile	Ala	Val	Val	Leu	Gln	Leu	Ser	Gln	Gln	Leu	Ser	165	170	175	
Gly	Ile	Asn	Ala	Val	Phe	Tyr	Tyr	Ser	Thr	Ser	Ile	Phe	Glu	Lys	Ala	180	185	190	
Gly	Val	Gln	Gln	Pro	Val	Tyr	Ala	Thr	Ile	Gly	Ser	Gly	Ile	Val	Asn	195	200	205	
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Arg	Thr	Leu	His	Leu	Ile	Gly	Leu	Ala	Gly	Met	Ala	Gly	Cys	Ala	Val	225	230	235	240
Leu	Met	Thr	Ile	Ala	Leu	Ala	Leu	Leu	Glu	Gln	Leu	Pro	Trp	Met	Ser	245	250	255	
Tyr	Leu	Ser	Ile	Val	Ala	Ile	Phe	Gly	Phe	Val	Ala	Phe	Phe	Glu	Val	260	265	270	
Gly	Pro	Gly	Pro	Ile	Pro	Trp	Phe	Ile	Val	Ala	Glu	Leu	Phe	Ser	Gln	275	280	285	
Gly	Pro	Arg	Pro	Ala	Ala	Ile	Ala	Val	Ala	Gly	Phe	Ser	Asn	Trp	Thr	290	295	300	
Ser	Asn	Phe	Ile	Val	Gly	Met	Cys	Phe	Gln	Tyr	Val	Glu	Gln	Leu	Cys	305	310	315	320
Gly	Pro	Tyr	Val	Phe	Ile	Ile	Phe	Thr	Val	Leu	Leu	Val	Leu	Phe	Phe	325	330	335	
Ile	Phe	Thr	Tyr	Phe	Lys	Val	Pro	Glu	Thr	Lys	Gly	Arg	Thr	Phe	Asp	340	345	350	
Glu	Ile	Ala	Ser	Gly	Phe	Arg	Gln	Gly	Gly	Ala	Ser	Gln	Ser	Asp	Lys	355	360	365	
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Tyr	Ser	Leu	Gly	Val	Ile	Asn	Ala	Pro	Gln	Lys	Val	Ile	Glu	Ala	His
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Tyr	Gly	Arg	Met	Leu	Gly	Ala	Ile	Pro	Met	Val	Arg	His	Ala	Thr	Asn
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Thr	Ser	Arg	Asp	Asn	Ala	Thr	Ile	Thr	Val	Thr	Ile	Pro	Gly	Thr	Glu
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Ala	Trp	Gly	Ser	Ser	Glu	Gly	Thr	Leu	Ala	Pro	Ser	Ala	Gly	Phe	Glu
			85						90					95	
Asp	Pro	Thr	Val	Ser	Pro	His	Ile	Leu	Thr	Met	Tyr	Trp	Ser	Leu	Ser
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Val	Ser	Met	Phe	Ala	Val	Gly	Gly	Met	Val	Ser	Ser	Phe	Thr	Val	Gly
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Trp	Ile	Gly	Asp	Arg	Leu	Gly	Arg	Val	Lys	Ala	Met	Leu	Val	Val	Asn
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Val	Leu	Ser	Ile	Ala	Gly	Asn	Leu	Leu	Met	Gly	Leu	Ala	Lys	Met	Gly
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Pro	Ser	His	Ile	Leu	Ile	Ile	Ala	Gly	Arg	Ala	Ile	Thr	Gly	Leu	Tyr
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Cys	Gly	Leu	Ser	Ser	Gly	Leu	Val	Pro	Met	Tyr	Val	Ser	Glu	Val	Ser
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Pro	Thr	Ala	Leu	Arg	Gly	Ala	Leu	Gly	Thr	Leu	His	Gln	Leu	Ala	Ile
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Ser	Val	Phe	Leu	Val	Glu	Lys	Ala	Gly	Arg	Arg	Ser	Leu	Phe	Leu	Ala
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Trp	Phe	Ile	Val	Ala	Glu	Leu	Phe	Ser	Gln	Gly	Pro	Arg	Pro	Ala	Ala
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 Ser Ile Met Leu Gln Leu Ser Gln Gln Leu Ser Gly Ile Asn Ala Val  
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385					390					395					400
Ala	Met	Ala	Val	Ala	Gly	Cys	Ser	Asn	Trp	Thr	Ser	Asn	Phe	Leu	Val
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Gly	Leu	Leu	Phe	Pro	Ser	Ala	Thr	Phe	Tyr	Leu	Gly	Ala	Tyr	Val	Phe
			420					425					430		
Ile	Val	Phe	Thr	Val	Phe	Leu	Val	Ile	Phe	Trp	Val	Phe	Thr	Phe	Phe
		435					440					445			
Lys	Val	Pro	Glu	Thr	Arg	Gly	Arg	Thr	Phe	Glu	Glu	Ile	Thr	Arg	Ala
	450					455					460				
Phe	Glu	Gly	Gln	Val	Gln	Thr	Gly	Thr	Arg	Gly	Glu	Lys	Gly	Pro	Ile
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Gln	Gln	Arg	Val	Thr	Gly	Thr	Leu	Val	Leu	Ala	Val	Phe	Ser	Ala	Val
			20					25					30		
Leu	Gly	Ser	Leu	Gln	Phe	Gly	Tyr	Asn	Ile	Gly	Val	Ile	Asn	Ala	Pro
		35					40					45			
Gln	Lys	Val	Ile	Glu	Gln	Ser	Tyr	Asn	Glu	Thr	Trp	Leu	Gly	Arg	Gln
	50					55					60				
Gly	Pro	Glu	Gly	Pro	Ser	Ser	Ile	Pro	Pro	Gly	Thr	Leu	Thr	Thr	Leu
65					70					75					80
Trp	Ala	Leu	Ser	Val	Ala	Ile	Phe	Ser	Val	Gly	Gly	Met	Ile	Ser	Ser
			85					90						95	
Phe	Leu	Ile	Gly	Ile	Ile	Ser	Gln	Trp	Leu	Gly	Arg	Lys	Arg	Ala	Met
			100					105					110		
Leu	Val	Asn	Asn	Val	Leu	Ala	Val	Leu	Gly	Gly	Ser	Leu	Met	Gly	Leu
		115					120					125			
Ala	Asn	Ala	Ala	Ala	Ser	Tyr	Glu	Met	Leu	Ile	Leu	Gly	Arg	Phe	Leu
	130					135					140				
Ile	Gly	Ala	Tyr	Ser	Gly	Leu	Thr	Ser	Gly	Leu	Val	Pro	Met	Tyr	Val
145					150					155					160
Gly	Glu	Ile	Ala	Pro	Thr	His	Leu	Arg	Gly	Ala	Leu	Gly	Thr	Leu	Asn
				165					170					175	

Gln Leu Ala Ile Val Ile Gly Ile Leu Ile Ala Gln Val Leu Gly Leu  
 180 185 190  
 Glu Ser Leu Leu Gly Thr Ala Ser Leu Trp Pro Leu Leu Gly Leu  
 195 200 205  
 Thr Val Leu Pro Ala Leu Leu Gln Leu Val Leu Leu Pro Phe Cys Pro  
 210 215 220  
 Glu Ser Pro Arg Tyr Leu Tyr Ile Ile Gln Asn Leu Glu Gly Pro Ala  
 225 230 235 240  
 Arg Lys Ser Leu Lys Arg Leu Thr Gly Trp Ala Asp Val Ser Gly Val  
 245 250 255  
 Leu Ala Glu Leu Lys Asp Glu Lys Arg Lys Leu Glu Arg Glu Arg Pro  
 260 265 270  
 Leu Ser Leu Leu Gln Leu Leu Gly Ser Arg Thr His Arg Gln Pro Leu  
 275 280 285  
 Ile Ile Ala Val Val Leu Gln Leu Ser Gln Gln Leu Ser Gly Ile Asn  
 290 295 300  
 Ala Val Phe Tyr Tyr Ser Thr Ser Ile Phe Glu Thr Ala Gly Val Gly  
 305 310 315 320  
 Gln Pro Ala Tyr Ala Thr Ile Gly Ala Gly Val Val Asn Thr Val Phe  
 325 330 335  
 Thr Leu Val Ser Val Leu Leu Val Glu Arg Ala Gly Arg Arg Thr Leu  
 340 345 350  
 His Leu Leu Gly Leu Ala Gly Met Cys Gly Cys Ala Ile Leu Met Thr  
 355 360 365  
 Val Ala Leu Leu Leu Leu Glu Arg Val Pro Ala Met Ser Tyr Val Ser  
 370 375 380  
 Ile Val Ala Ile Phe Gly Phe Val Ala Phe Phe Glu Ile Gly Pro Gly  
 385 390 395 400  
 Pro Ile Pro Trp Phe Ile Val Ala Glu Leu Phe Ser Gln Gly Pro Arg  
 405 410 415  
 Pro Ala Ala Met Ala Val Ala Gly Phe Ser Asn Trp Thr Ser Asn Phe  
 420 425 430  
 Ile Ile Gly Met Gly Phe Gln Tyr Val Ala Glu Ala Met Gly Pro Tyr  
 435 440 445  
 Val Phe Leu Leu Phe Ala Val Leu Leu Leu Gly Phe Phe Ile Phe Thr  
 450 455 460  
 Phe Leu Arg Val Pro Glu Thr Arg Gly Arg Thr Phe Asp Gln Ile Ser  
 465 470 475 480  
 Ala Ala Phe His Arg Thr Pro Ser Leu Leu Glu Gln Glu Val Lys Pro  
 485 490 495  
 Ser Thr Glu Leu Glu Tyr Leu Gly Pro Asp Glu Asn Asp  
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 Gly Tyr Asn Val Ala Ala Val Asn Ser Pro Ala Leu Leu Met Gln Gln  
 35 40 45

Phe	Tyr	Asn	Glu	Thr	Tyr	Tyr	Gly	Arg	Thr	Gly	Glu	Phe	Met	Glu	Asp
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Phe	Pro	Leu	Thr	Leu	Leu	Trp	Ser	Val	Thr	Val	Ser	Met	Phe	Pro	Phe
65					70					75					80
Gly	Gly	Phe	Ile	Gly	Ser	Leu	Leu	Val	Gly	Pro	Leu	Val	Asn	Lys	Phe
			85						90					95	
Gly	Arg	Lys	Gly	Ala	Leu	Leu	Phe	Asn	Asn	Ile	Phe	Ser	Ile	Val	Pro
			100					105						110	
Ala	Ile	Leu	Met	Gly	Cys	Ser	Arg	Val	Ala	Thr	Ser	Phe	Glu	Leu	Ile
		115						120					125		
Ile	Ile	Ser	Arg	Leu	Leu	Val	Gly	Ile	Cys	Ala	Gly	Val	Ser	Ser	Asn
	130					135					140				
Val	Val	Pro	Met	Tyr	Leu	Gly	Glu	Leu	Ala	Pro	Lys	Asn	Leu	Arg	Gly
145					150					155					160
Ala	Leu	Gly	Val	Val	Pro	Gln	Leu	Phe	Ile	Thr	Val	Gly	Ile	Leu	Val
				165						170					175
Ala	Gln	Ile	Phe	Gly	Leu	Arg	Asn	Leu	Leu	Ala	Asn	Val	Asp	Gly	Trp
			180					185						190	
Pro	Ile	Leu	Leu	Gly	Leu	Thr	Gly	Val	Pro	Ala	Ala	Leu	Gln	Leu	Leu
	195						200					205			
Leu	Leu	Pro	Phe	Phe	Pro	Glu	Ser	Pro	Arg	Tyr	Leu	Leu	Ile	Gln	Lys
	210					215					220				
Lys	Asp	Glu	Ala	Ala	Ala	Lys	Lys	Ala	Leu	Gln	Thr	Leu	Arg	Gly	Trp
225					230					235					240
Asp	Ser	Val	Asp	Arg	Glu	Val	Ala	Glu	Ile	Arg	Gln	Glu	Asp	Glu	Ala
				245						250				255	
Glu	Lys	Ala	Ala	Gly	Phe	Ile	Ser	Val	Leu	Lys	Leu	Phe	Arg	Met	Arg
			260					265						270	
Ser	Leu	Arg	Trp	Gln	Leu	Leu	Ser	Ile	Ile	Val	Leu	Met	Gly	Gly	Gln
		275					280					285			
Gln	Leu	Ser	Gly	Val	Asn	Ala	Ile	Tyr	Tyr	Tyr	Ala	Asp	Gln	Ile	Tyr
	290					295					300				
Leu	Ser	Ala	Gly	Val	Pro	Glu	Glu	His	Val	Gln	Tyr	Val	Thr	Ala	Gly
305					310					315					320
Thr	Gly	Ala	Val	Asn	Val	Val	Met	Thr	Phe	Cys	Ala	Val	Phe	Val	Val
				325					330					335	
Glu	Leu	Leu	Gly	Arg	Arg	Leu	Leu	Leu	Leu	Gly	Phe	Ser	Ile	Cys	
			340					345					350		
Leu	Ile	Ala	Cys	Cys	Val	Leu	Thr	Ala	Ala	Leu	Ala	Leu	Gln	Asp	Thr
	355						360					365			
Val	Ser	Trp	Met	Pro	Tyr	Ile	Ser	Ile	Val	Cys	Val	Ile	Ser	Tyr	Val
	370					375					380				
Ile	Gly	His	Ala	Leu	Gly	Pro	Ser	Pro	Ile	Pro	Ala	Leu	Leu	Ile	Thr
385					390					395					400
Ile	Phe	Leu	Gln	Ser	Ser	Arg	Pro	Ser	Ala	Phe	Met	Val	Gly	Gly	Ser
				405					410					415	
Val	His	Trp	Leu	Ser	Asn	Phe	Thr	Val	Gly	Leu	Ile	Phe	Pro	Phe	Ile
			420					425					430		
Gln	Glu	Gly	Leu	Gly	Pro	Tyr	Ser	Phe	Ile	Val	Phe	Ala	Val	Ile	Cys
		435				440						445			
Leu	Ile	Thr	Thr	Ile	Tyr	Ile	Phe	Leu	Ile	Val	Pro	Glu	Thr	Lys	Ala
	450					455					460				
Lys	Thr	Phe	Ile	Glu	Ile	Asn	Gln	Ile	Phe	Thr	Lys	Met	Asn	Lys	Val
465					470					475					480
Ser	Glu	Val	Tyr	Pro	Glu	Lys	Glu	Glu	Leu	Lys	Glu	Leu	Pro	Pro	Val
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Thr Ser Glu Gln  
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21

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18

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20 25 30  
Gly Val Ile Asn Ala Pro Gln Lys Val Ile Glu Ala Phe Tyr Glu Thr  
35 40 45  
Trp Leu Gly Arg Xaa Gly Glu Xaa Pro Ser Val Pro Thr Leu Thr Leu  
50 55 60  
Leu Trp Ser Leu Ser Val Ser Ile Phe Ala Val Gly Gly Met Ile Gly  
65 70 75 80  
Ser Phe Leu Val Gly Xaa Ile Gly Asn Arg Leu Gly Arg Lys Xaa Ala  
85 90 95  
Met Leu Val Asn Asn Val Leu Ala Ile Ala Gly Gly Leu Leu Met Gly  
100 105 110  
Leu Ala Lys Xaa Ala Xaa Ser Phe Glu Met Leu Ile Leu Gly Arg Phe  
115 120 125  
Ile Ile Gly Leu Tyr Cys Gly Leu Ser Ser Gly Val Val Pro Met Tyr

130		135		140
Val Gly Glu Ile Ser Pro Thr Ala Leu Arg Gly Ala Leu Gly Thr Leu				
145		150		155
Asn Gln Leu Gly Ile Val Ile Gly Ile Leu Ile Ala Gln Val Leu Gly				160
	165		170	175
Leu Asp Ser Leu Leu Gly Asn Glu Ser Leu Trp Pro Leu Leu Leu Gly				
	180		185	190
Leu Thr Gly Val Pro Ala Leu Leu Gln Leu Leu Leu Leu Pro Phe Cys				
	195		200	205
Pro Glu Ser Pro Arg Tyr Leu Leu Ile Asn Lys Asn Glu Glu Ala Arg				
	210		215	220
Ala Lys Lys Ala Leu Gln Arg Leu Arg Gly Thr Ala Asp Val Ser Gln				
225		230		235
Glu Val Ala Glu Met Lys Asp Glu Ser Arg Xaa Met Xaa Ser Glu Lys				
	245		250	255
Xaa Val Ser Val Leu Glu Leu Phe Arg Ser Arg Xaa Tyr Arg Gln Pro				
	260		265	270
Val Ile Ile Ala Ile Val Leu Gln Leu Ser Gln Gln Leu Ser Gly Ile				
	275		280	285
Asn Ala Val Phe Tyr Tyr Ser Thr Ser Ile Phe Glu Lys Ala Gly Val				
	290		295	300
Gly Gln Pro Val Tyr Ala Thr Ile Gly Ala Gly Val Val Asn Thr Val				
305		310		315
Phe Thr Val Val Ser Val Phe Val Val Glu Arg Ala Gly Arg Arg Thr				
	325		330	335
Leu His Leu Leu Gly Leu Gly Gly Met Ala Gly Cys Ala Val Leu Met				
	340		345	350
Thr Ile Ala Leu Ala Leu Leu Asp Gln Val Pro Trp Met Ser Tyr Val				
	355		360	365
Ser Ile Val Ala Ile Phe Gly Phe Val Ala Phe Phe Glu Val Gly Pro				
	370		375	380
Gly Pro Ile Pro Trp Phe Ile Val Ala Glu Leu Phe Ser Gln Gly Pro				
385		390		395
Arg Pro Ala Ala Ile Ala Val Ala Gly Phe Ser Asn Trp Thr Ser Asn				
	405		410	415
Phe Ile Val Gly Leu Leu Phe Gln Tyr Ile Ala Glu Leu Leu Gly Pro				
	420		425	430
Tyr Val Phe Ile Val Phe Ala Val Leu Leu Leu Leu Phe Phe Ile Phe				
	435		440	445
Thr Phe Leu Lys Val Pro Glu Thr Lys Gly Arg Thr Phe Asp Glu Ile				
	450		455	460
Ala Ala Ala Phe Arg Lys Xaa Asn Lys Xaa Glu Gln Pro Glu Lys Glu				
465		470		475
Ser Ile Glu Glu Leu Glu Pro Leu Gly Pro Asp Glu Xaa				480
	485		490	